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PROFESSIONAL COMMENT.

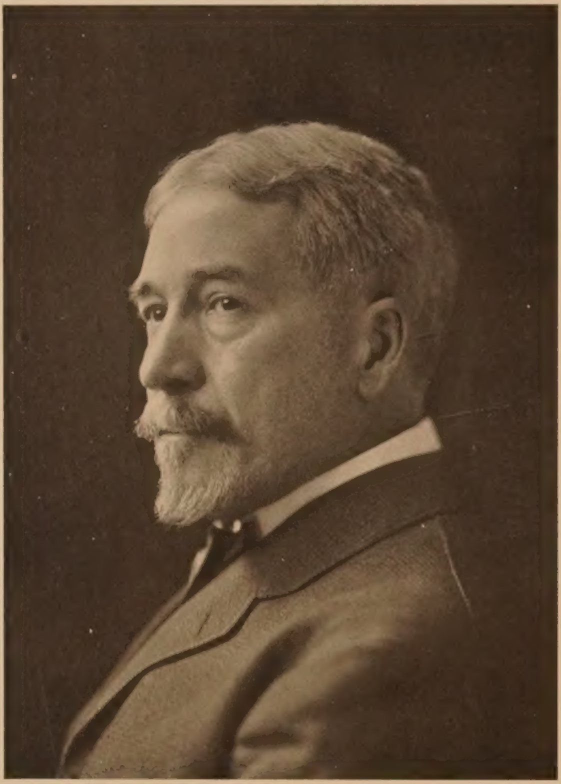
THE United States Government is now preparing to hold several important competitions under the provisions of the Tarnsey Act, for which programs are likely to be issued within a short time. One of the most important is that for the Building of the Bureau of American Republics, for which Mr. Andrew Carnegie has given the sum of $750,000. The building will stand on a five-acre plot of ground now used by the George Washington University. The competition will be of mixed variety, and several firms are to be invited and to be paid a bonus of $1,000 each. Architects not thus designated will be admitted to the competition for prizes of $3,000, $2,000 and $1,000 respectively.

The preliminaries are now being arranged for the competition to be held for the new New York Post Office which is to be erected practically in connection with the new Pennsylvania station.

The Legislature of Porto Rico has passed a bill appropriating $150,000 for the construction of a Capitol building at San Juan. This appropriation is expected to cover only the preliminary work, and the additional provisions will be made during the next year, to complete the contemplated building. The program has not yet been definitely arranged, but it has been decided that practitioners in both Porto Rico and the United States will be invited to compete, and that several prizes will be offered.

THE architect practicing in New York finds that his knowledge of the law affecting matters of building and construction is quite as important in carrying on his practice as is his knowledge of design. We do not recollect a year when there were so many changes contemplated or in process in the various laws and ordinances affecting building matters, as in the present year. Since our last issue, the personnel of the Building Code Commission has been radically altered by the addition of two architects, two plumbers, two builders, the representatives of the Borough Presidents, and the Chief of the Fire Department; the latter being without votes, however. These additions now make a membership of some 30 members, with a voting force of 24, far too large in our opinion for the Commission to accomplish efficient work. The increase in this Commission was due to causes purely political. About the time of the appointment of the original Commission, the control of the Board of Aldermen changed from one side to the other in consequence of the altered attitude of the men elected upon the Hearst ticket, and it was found impossible to secure confirmation of the original Commission without effecting a compromise with the new majority. This compromise, however, was not effected without consultation with the original members, who, while believing that things would be better if left alone, also realized that the Board of Aldermen unquestionably had the power of promptly disapproving of any report that they might finally bring in, so that if anything were to be accomplished at all, it was advisable that the people who would have the final approval of any code that might be presented would have to be considered at the inception of the work, if any results at all were to be accomplished.

IN this session of the legislature the Tenement House Act is being attacked in its most vital parts by Mr. Sheridan, representative in the Assembly from the Borough of the Bronx, who has introduced six bills, which if passed, would absolutely prevent the slow but sure betterment of tenement conditions which New York is obtaining under the existing Act. Every one of these bills is objectionable from the point of view of tenement house reform, and as their passage would be a decided step backwards in this form of legislation, it behooves every man, who has the interest of his city at heart, to use whatever influence he has to secure the defeat of these measures. The most important is Assembly Bill 609, which would change the definition of a tenement house by exempting from the provisions of the law houses occupied by three families. The Tenement House law, when originally enacted in 1867, did not apply to three family houses, but only to houses containing four families or more. In 1887—twenty years ago, as the result of the conditions which were found then to exist in three family houses, it was found necessary to amend the law so as to class all houses containing three families or more as tenements. Such has been the law from 1887 to the present time. If this amendment were to prevail, it would remove from the provisions of the Act fully 30,000 houses, or nearly one half of all of the tenements in the city, and would leave such buildings without any safe-guards or restrictions. The Charity Organization Society states, that the experience of the Tenement House Department shows that many three family houses are the worst in the city, from a sanitary standpoint, and require constant attention on the part of the Department. The argument used in favor of this Amendment is, that it will cause three family houses to be built in the outlying districts, and that this in turn will reduce rents by providing a large supply of modest apartments. The facts are that these districts, particularly in Queens and the Bronx, are now being built up with two family houses which is exactly the object which the present law hoped to accomplish, and it is the very men who are building these two family houses who are behind the proposed amendment. Two other bills are wholly vicious in their proposed changes, in so much as they provide that there may be no stairs to the roof in three family houses with peaked roofs, where the scuttle is "dangerous or useless." In our experience we have never been able to find a scuttle which answers this description, but we do know that the papers are continually recording the deaths under the most horrible circumstances of women and children whose lives are lost in conflagrations occurring in tenement houses through the fact that they have been unable to reach the roof in attempting to escape from the fire. Two other bills by the same energetic gentleman purpose to relieve the speculative builder of tenements of the necessity of obeying that portion of the law, providing he is able to secure immunity through the use of influence or in any other way. One changes the mandatory provisions of the existing law and gives the tenement house commissioner or his subordinates the discretionary power which has been prolific of so much trouble in the administration of the building code. The other relieves the completed building of the necessity of securing a certificate of compliance and to allow the occupancy of such building to commence upon the approval, not of the Tenement House Department, but of the Superintendent of Buildings. Still another bill withdraws from the definition of tenements old buildings of two-stories and basement in height, occupied by two families, with a provision for three, and in our opinion it is obvious that a building so arranged will be occupied by three families, and the law will be evaded irrespective of this classification. All of these bills are opposed by every philanthropic interest in New York City, which concerns itself with tenement house matters. Their passage would do untold injury to the accomplishment of better housing conditions for New York's large tenement population. They should be promptly killed.



Architects of To-Day.

MR. W. H. SYMONDS, NEW YORK.

A bill introduced by Senator Mullaney has received very little notice from the public press, although from the architect's standpoint it is of primary importance, as it brings up the much talked of subject of the necessity of regulating the height of buildings in the City of New York. More than this, it attempts to make such regulations upon a basis which is decidedly new in American legislation, as after making general restrictions as to the height of buildings, it provides that "where a lot fronts on a public square, or open public square, or where the street, road, or avenue, on which it fronts is more than one hundred feet wide, or where it is opposite the end of a street more than 60 feet wide, the upper floor of any building to be erected thereon may be carried to a greater height above the curb * * *, providing, however, that the design and plan of such building shall be approved as being neither detrimental to the health or comfort of the citizens, or injurious to the beauty of the city. Such approval shall be evidenced by a certificate in writing, signed by the president of the health department in the City of New York, the Superintendent of Buildings of said City, and a member of the Council of the Fine Arts Federation, to be appointed from its membership for such purpose, and such certificate signed by all parties shall be filed with the plans of such improvement in the Department of Buildings of said city." With the exception of the composition of the Board whose approval it is necessary to obtain, we think this creates a utopian condition which it will be hardly possible for New York to obtain for many years. But conisdering the district which Mr. Mullaney represents, (the neighborhood between the Battery and City Hall,) it is easy to see that his constituents, although few in number, have felt the unsanitary conditions imposed by the high buildings with more keenness and reality than people in other portions of the city. To these people, the menace of the high buildings is a real thing. To most of us, who spend but a few hours a day in this forest of brick and mortar, the danger is only far off when the whole island shall be similarly built up. But it is a serious question whether this is not a time to make the restriction rather than to wait until after the evil has been accomplished. The main provisions of the proposed act provided that no building shall be erected to a greater height above the curb level at the centre of the front than "20 times the square root of the width of the street," which practically means 150 feet on the average 60-foot highway, although buildings on wider streets are allowed to be carried to a total height of what amounts to 200 feet. While approving the general principle of this bill, it seems unwise at this time, in view of the fact that as New York's building code is about to be revised, the Commission in charge of the work should be hampered as little as possible at the beginning of its work by any additional State Legislation.

REINFORCED CONCRETE.*

REINFORCED concrete as a building material has become within the last few years so popular that it threatens to have as successful a career as the now famous skeleton steel construction. Under these circumstances, a brief discussion of its various qualities, both advantageous and disadvantageous, may not be amiss. Before, however, discussing it from the practical architectural point of view, a short history of its birth and early development may not be out of place.

Cement work as a building material was known to the Romans, while steel belongs to a more modern age: in fact, not dating back much beyond twenty-five or thirty years. The use of these two materials in combination seems to have made its first appearance at the exhibition of 1855 in Paris. A boat with a sort of iron grillage in the interior was shown at that time. Crude as this boat may have been in construction, it was, however, a *bona fide* use of concrete and steel in combination as a constructive material. The people who made this first essay never seem to have developed it much beyond this one sample for exhibition purposes.

The next we hear of concrete and steel as a constructive material was in a pamphlet written by M. Coignet, *père,* in 1861, and published by Lacroix in Paris. In this pamphlet M. Coignet suggested various uses to which reinforced concrete with iron rods could be put. He does not seem, however, to have gone much beyond suggestion, for there are no buildings designed by him in existence where he actually employed the material.

Six years later, M. Joseph Monier, florist and gardener, seems to have been the first person to really make practical use of the material. He made large flower pots out of it, and found that by reinforcing the interiors of his cement pots with wire he could very materially reduce their thickness and so their weight. Following up his first experiment with flower pots, he began to make basins for fountains, and from that tanks and even floors and small bridges. The use of the material for the basins for fountains and tanks seems to have been suggested to M. Monier by his own professional requirements, that is to say, for a material to be used in landscape architecture.

Nobody else seems to have realized the excellence of this method of construction, and it was left for Monier to have the monopoly of it until he exhibited some of his work at the exhibition in Antwerp in 1879. Here it was remarked by Mr. G. A. Wayss. He was a German engineer, and was very quick to realize the enormous advantages of Monier's method of construction. He brought up Monier's patents in 1880, and established business for exploiting this method of construction both in Berlin and Frankfort and somewhat later in Vienna.

When we next hear of reinforced concrete again it was in a paper by M. Coignet, *fils,* read in 1888 before the Societe des Ingenieurs Civils. In this paper he followed in his father's footsteps and somewhat amplified his ideas, but nothing was done by him practically until some four years later. In the meantime, in 1889, M. P. Cottancin in France used a sort of cross network of wires as a reinforcement, and took out a patent on this method.

In 1892, four years later, both M. Coignet, *fils,* and M. Hennebique brought forth their systems and put them on the market. Before this, even as early as 1879, Mr. Hennebique claims to have used this method of construction in a floor, but it was not until 1892, thirteen years later, that he actually began to use the material extensively. Mr. Hennebique was not an engineer, as he is generally credited with being, but a large contractor, and at this epoch, 1892, he had a contract for the harbor works at Antwerp, and he also for a large building at Roubaix. In both of these structures he employed reinforced concrete. In his employ at the time were two young engineers. M. M. Foort and Blaudot by name, Belgians, and to them really seems more due the credit for the development of the system which was put forward under Mr. Hennebique's name, than to himself. However this may be, Hennebique's name seems to have been associated with the early beginnings of reinforced concrete more than any other particular person, and in many of the books, as well as in the mind of the general public, he seems to be credited with the invention of this material. It is true that he, as a rich contractor, did give the material a very strong boost on its way to success by using it himself in any large works he might have under way, and so demonstrating its usefulness by being willing to take the responsibility and risk of a new system of construction. Up to the present time, over five thousand buildings have been put up under his patents.

About this same time, 1892, Hyatt & Ransome started independently in this country .

During the last ten or twelve years, that is to say, from about 1895 down to the present time, the material as a mode of construction has made tremendous strides in public favor, especially all over Europe, and all sorts of sytems have been put forward by engineers in the different countries on the Continent.

In this country the material seems to have met with a more cordial reception in the West, where the architects and engineers are not, perhaps, so bound down by convention and conservatism as we are here in the East. As illustrative of this we may note the large office building which was put up in reinforced concrete in Cincinnati in 1902. Here in New York, or, more properly speaking, in

(Continued page 57)

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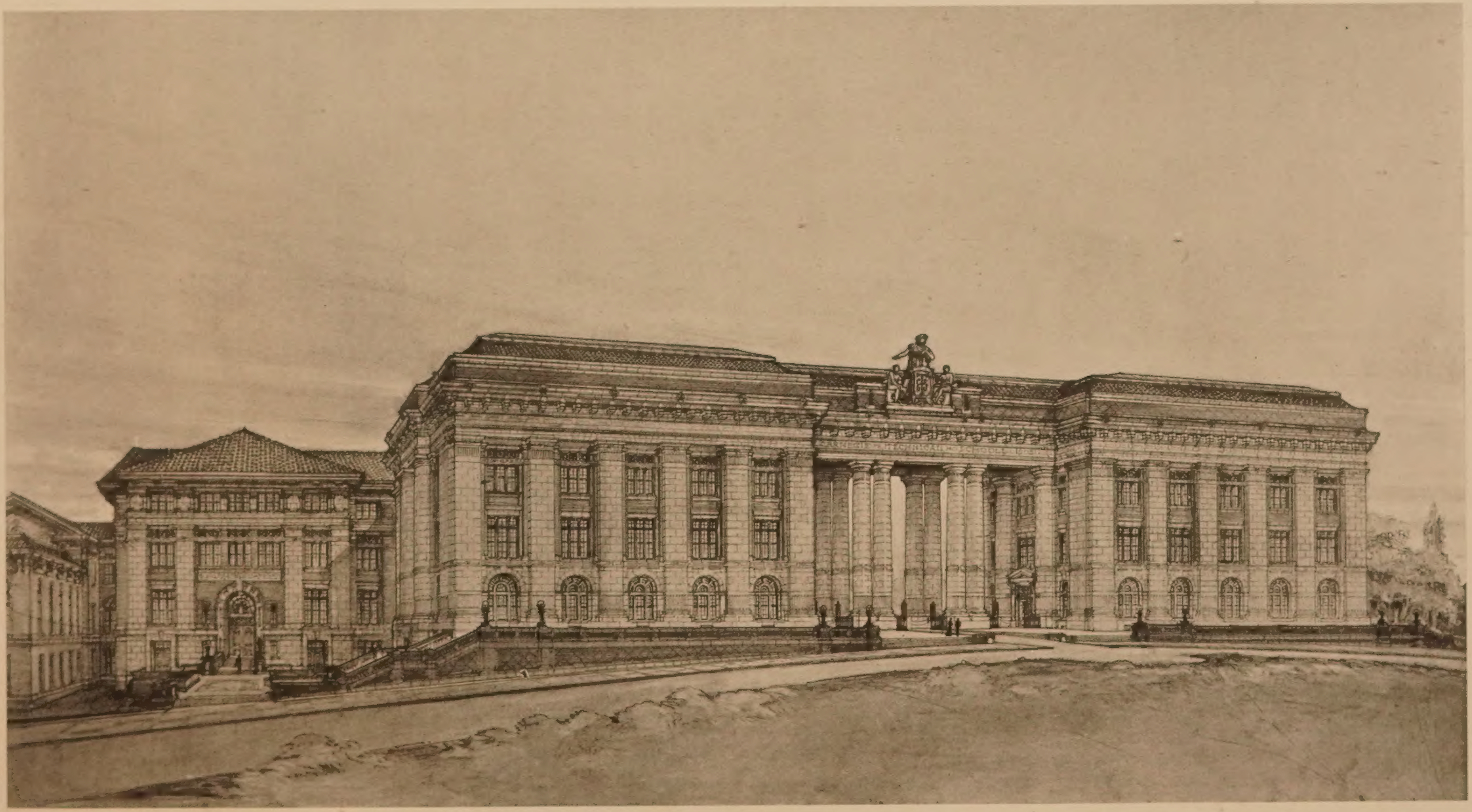
*Extracts from lecture before the Architectural League by Mr. G. T. Snelling.



PERSPECTIVE, ADMINISTRATION BUILDING, CARNEGIE TECHNICAL SCHOOLS, PITTSBURG.

Palmer & Hornbostel, Architects.

(Continued from page 55)

this vicinity, that is to say out in New Jersey, some low reinforced concrete buildings were put up along in 1901 and 1902, but we are inclined to think that the first building of any real importance was the garage in 93rd Street that my firm put up during the summer of 1904. Here the clear spans were about fifty feet. The entire frame of the building was of reinforced concrete. Since that time we have erected the apartment house in East 30th Street where we now have our offices and are about to begin a Vacene Laboratory in the Bronx for the N. Y. Board of Health. The apartment house in East 30th Street is a nine-story building, in which all the floors and uprights are of this material. Since our garage on 93rd Street, a number of buildings in this method of construction have been undertaken, especially garages, but none of any very great height until our apartment house and a building in West 52nd Street, which is of ten stories, only one more than the "Nottingham" in East 30th Street.

In England the material does not seem to have made very much headway, partly on account of the inherent conservatism of the English and their tendency to allow others to experiment with new materials and new notions before they step in themselves and profit by the mistakes of others, and partly because the building laws of the various English cities, especially in London, make no provision for this method of construction.

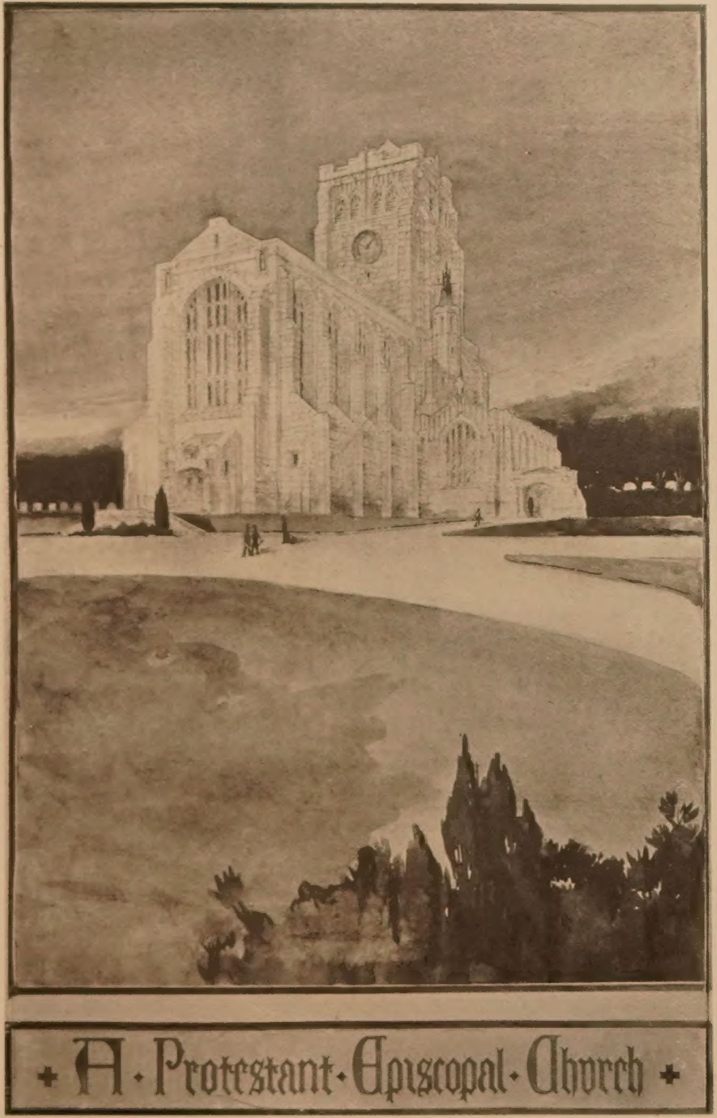
On the Continent, especially in the German speaking countries, its development seems to have been rapid, if not perhaps quite so rapid as here in America. The number of different systems that have been put forward is almost legion. They all, however, have the same end in view, that is to say, to make the material (steel) which has a high tensile resistance, take care of the pulling stresses, while the concrete, which is admirably adapted to look after compressive stresses, is made to take care of the crushing part of the work. The various systems may be, roughly speaking, divided into three classes: That in which no reliance is placed upon the tensile resistance of the concrete and where the steel does all this work, leaving the concrete to look after the compressive stresses pure and simple; second, those in which the steel takes care of all the tensile work, the concrete not considered sufficiently reliable to look after all the compressive work, and a certain amount of steel reinforcements are put into the compressive part of the beams to help out the concrete in doing this work; and, finally, one or two systems in which all the stresses, both tensile and compressive, are supposed to be borne by the steel reinforcements, and the concrete is only relied upon to stiffen the reinforcements somewhat and to protect them from fire and the attacks of the elements.

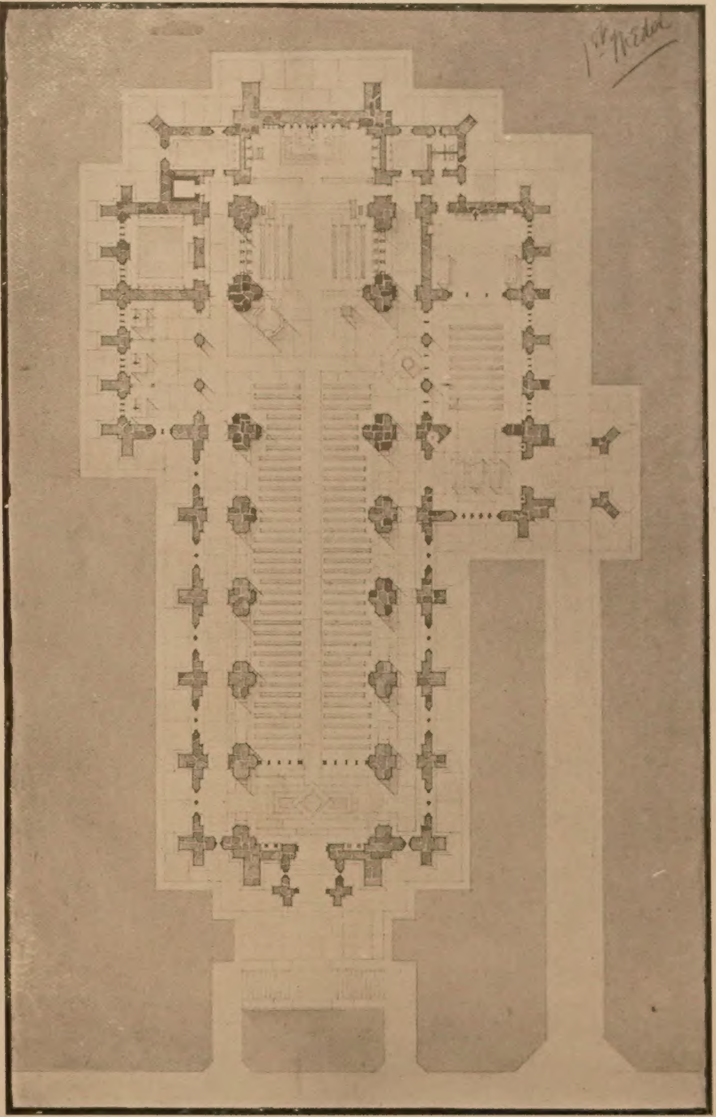
Many of the systems which have been devised seem to have been created purely with a view to make them different from somebody else's so-called system, in order that a patent could be obtained for them. The main principles of the relations which the steel and the concrete bore in these various systems to each other, however, always have remained the same. This effort to keep away from some other system and devise a new one led, as one might suppose, to some of them being very complicated. This is particularly so of one or two of the French and Spanish systems. This may be very well for countries where labor is as cheap as it is in France and Spain, but it would make these systems absolutely impossible here in America, where we are so bound by trades unionism and very high wages.

Briefly and broadly speaking, the various advantages and disadvantages of reinforced concrete as a building material may be summed up as follows:

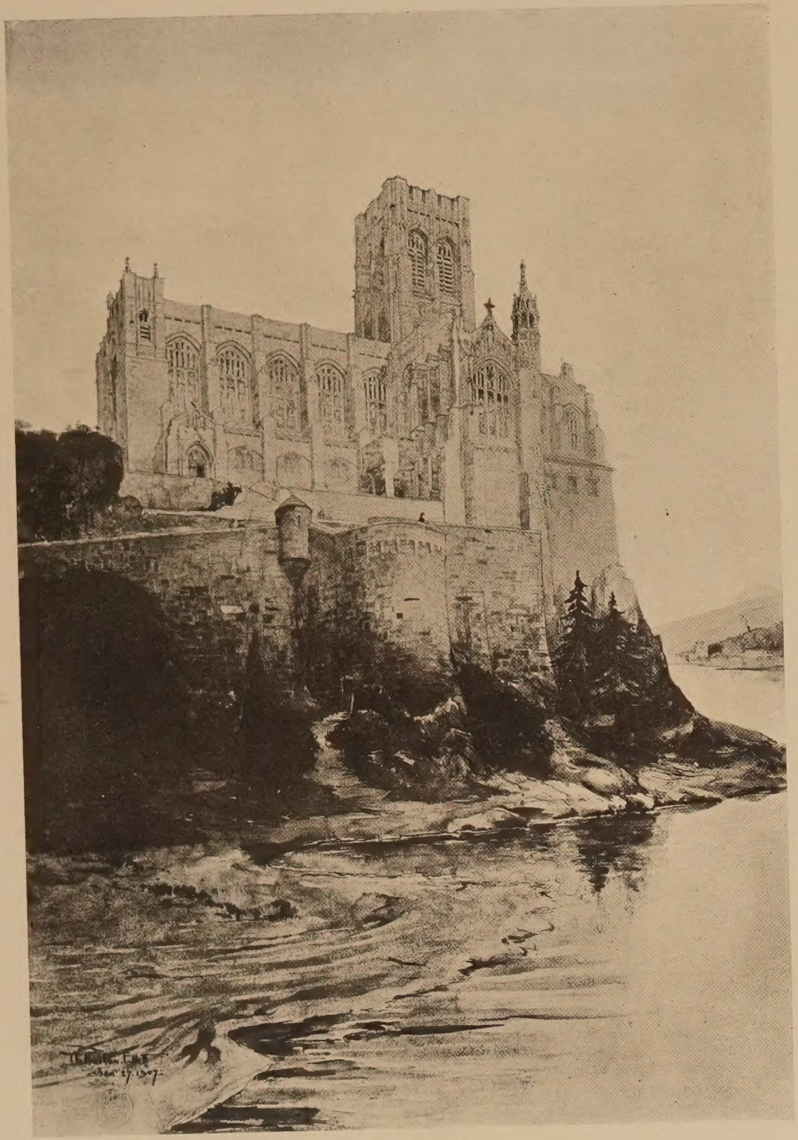
First, it is probably about as fireproof as anything that has been evolved up to the present time, and fireproof in the best sense of the word, because not only does fire not affect it to any appreciable extent, but when it is subjected to a stream of water while still in a state of great heat, which is the actual treatment any building material receives in a large conflagration, the disintegration that takes place in not of any serious consequence. The regulations of the New York Building Department provide that any system to be passed by them and accepted must be subjected to a fire which shall raise the temperature from between 1700 and 2000 degrees Fahr., and then immediately afterwards subjected to a stream of water from a 1 1-8-inch hose under a 60-lb. pressure, and after the whole mass has been allowed to cool, the deflections must be measured under a live load of 150 lbs. per sq. ft. This is a rather severe test, and the various systems that have been subjected to it have all come out in pretty good shape. In other words, the effect of high temperatures, followed by a stream of water on concrete does not penetrate very deeply into the material, but only affects the surface. The terra cotta fire protection for steel, some of the terra cotta fireproofing companies' opinions to the contrary notwithstanding, is certainly not as efficacious as a protective material as the concrete, owing to the difference in the coefficients in expansion between the steel and the terra cotta, and it certainly has been shown both at Baltimore and San Francisco that the tile arches and the terra cotta fireproofing protection did not stand as well as the concrete protection. The little Fidelity & Guaranty Trust building in Baltimore lost its walls and front, but its reinforced concrete frame came bravely through. Reinforced concrete also is a very good sound deadener, as it is not sympathetic to vibrations. In the apartment house in 30th Street, sound goes through the gypsum partitions to a certain extent where the collars have been placed in the floor slabs for the steam pipes to go through. Again, owing to its monolithic character, what settlement does take place in a building with a reinforced concrete frame is pretty apt to be absolutely uniform throughout. Then again, looking at the material entirely apart from the dictation of labor unions, it certainly is cheaper than steel frame construction, as it can be put in place by unskilled labor instead of a skilled housesmith. As by actual calculation the saving in the amount of steel employed to carry the same loads is about 15 per cent. less by weight than is the steel skeleton construction. This last assertion has merely been told me, and I have not myself absolutely verified it, so do not wish to put it forward as my own dictum. The floors in a reinforced concrete building can be made a great deal thinner, as we all know, than in the case of an ordinary steel skeleton construction. In fact, the gain in the heights of the buildings was what originally led to the vogue of this material in France. The building law in Paris has always limited the heights of buildings in proportion to the widths of the streets on which they faced, and when M. Hennebique put up an apartment house in Paris, and by a saving in the thickness of the floors managed to get in an extra story he natur-

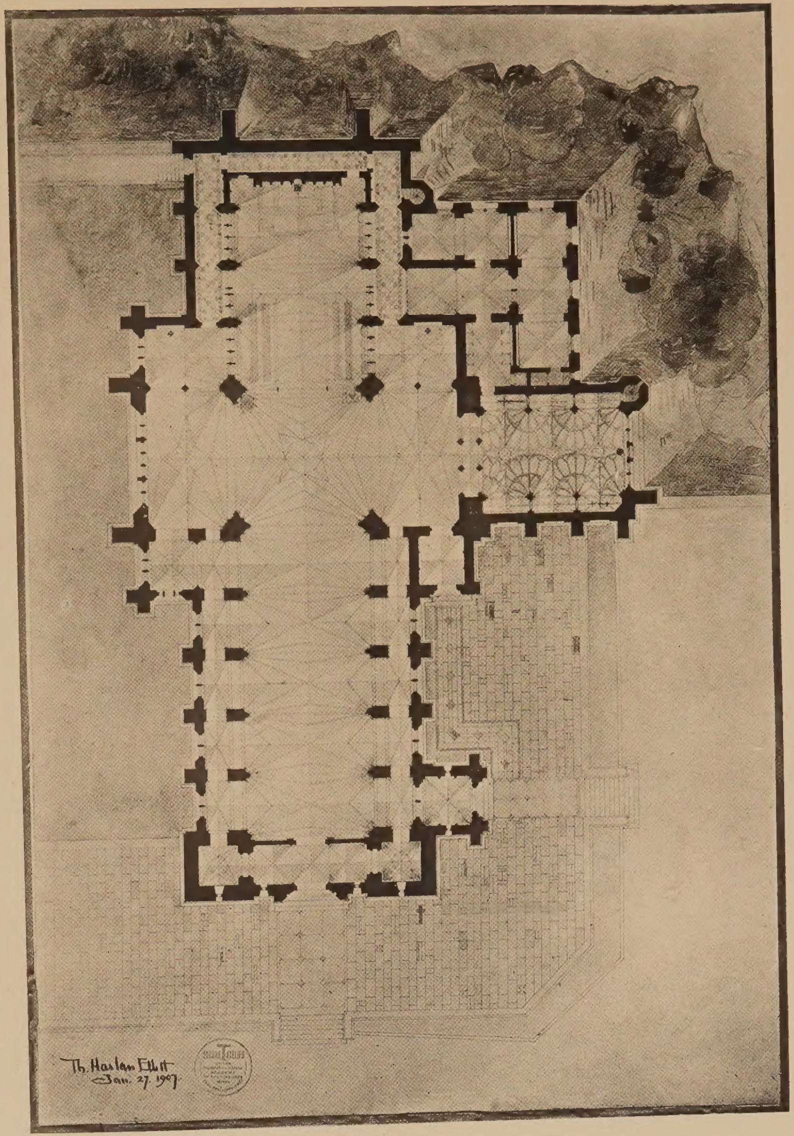
(Continued page 63)





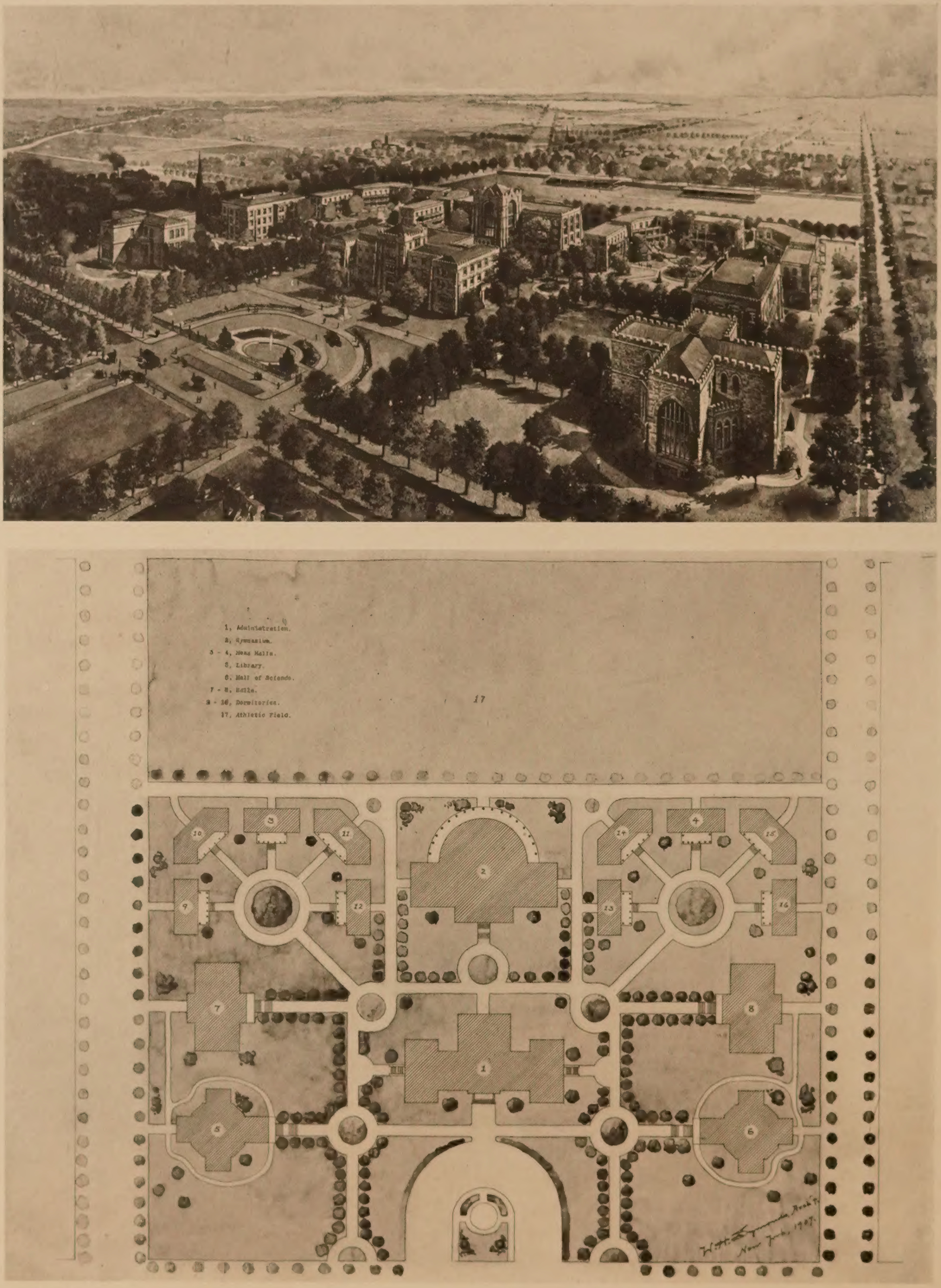
BEAUX ARTS COMPETITION—A PROTESTANT EPISCOPAL CHURCH. First Medal. C. E Cope, Atelier Cret.



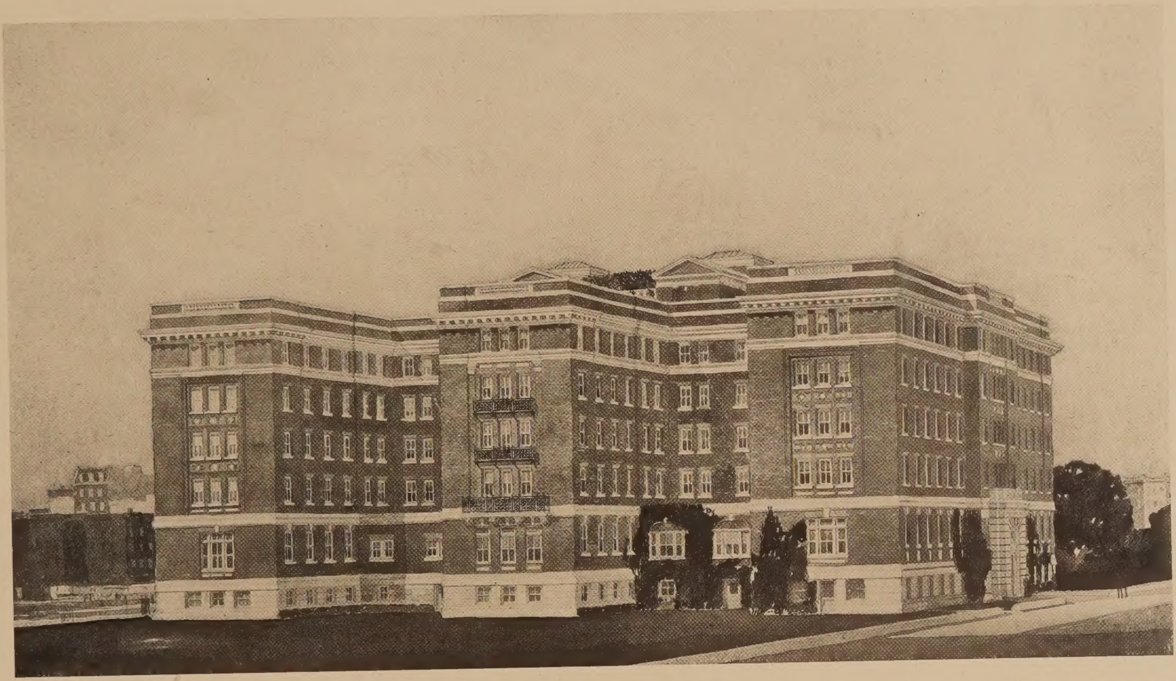


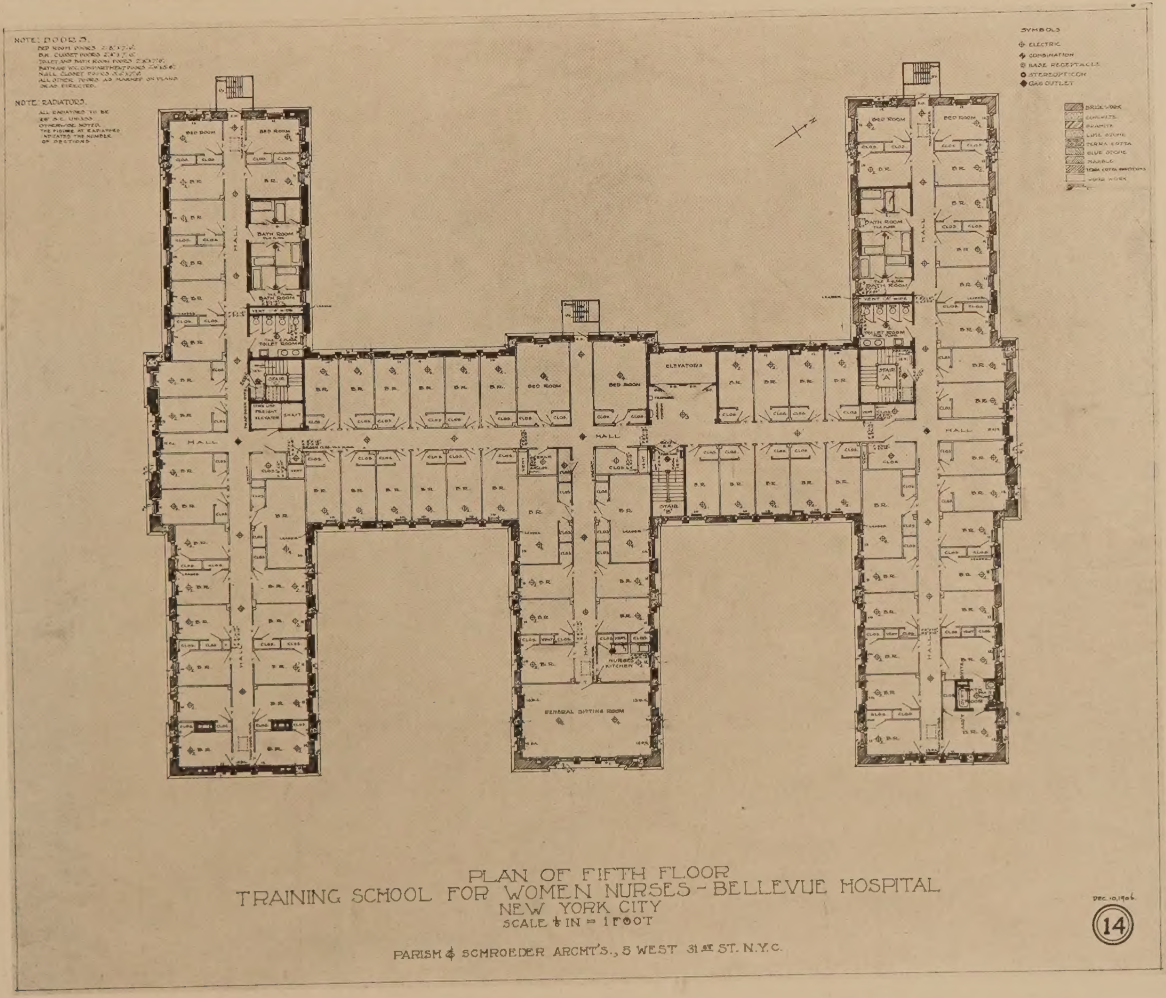
BEAUX ARTS COMPETITION—A PROTESTANT EPISCOPAL CHURCH.

Mention First Medal. T. H. Ellett, Atelier Cret.



PERSPECTIVE AND PLAN, STAMFORD COLLEGIATE INSTITUTE, STAMFORD, TEXAS. W. H. Symonds, Architect.




NOTE: DOORS.
BED ROOM DOORS 2'8"x7'6"
B.R. CLOSET DOORS 2'4"x7'6"
TOILET AND BATH ROOM DOORS 2'6"x7'6"
BATH AND W.C. COMPARTMENT DOORS 2'0"x5'6"
HALL CLOSET DOORS 2'6"x7'6"
ALL OTHER DOORS AS MARKED ON PLANS OR AS DIRECTED.
NOTE: RADIATORS.
ALL RADIATORS TO BE 38" A.C. UNLESS OTHERWISE NOTED.
THE FIGURE AT RADIATORS INDICATES THE NUMBER OF SECTIONS
SYMBOLS
ELECTRIC
COMBINATION
BASE RECEPTACLE
STEREOPTICON
GAS OUTLET
BRICK WORK
CONCRETE
GRANITE
LIME STONE
TERRA COTTA
BLUE STONE
MARBLE
TERRA COTTA PARTITIONS
WOOD WORK
BED ROOM
B.R.
CLOS.
HALL
BATH ROOM
TOILET ROOM
ELEVATORS
STAIR
FREIGHT ELEVATOR
NURSES KITCHEN
GENERAL SITTING ROOM
PLAN OF FIFTH FLOOR
TRAINING SCHOOL FOR WOMEN NURSES - BELLEVUE HOSPITAL
NEW YORK CITY
SCALE 1/8 IN = 1 FOOT
PARISH & SCHROEDER ARCHT'S., 5 WEST 31ST ST. N.Y.C.
DEC. 10, 1906.
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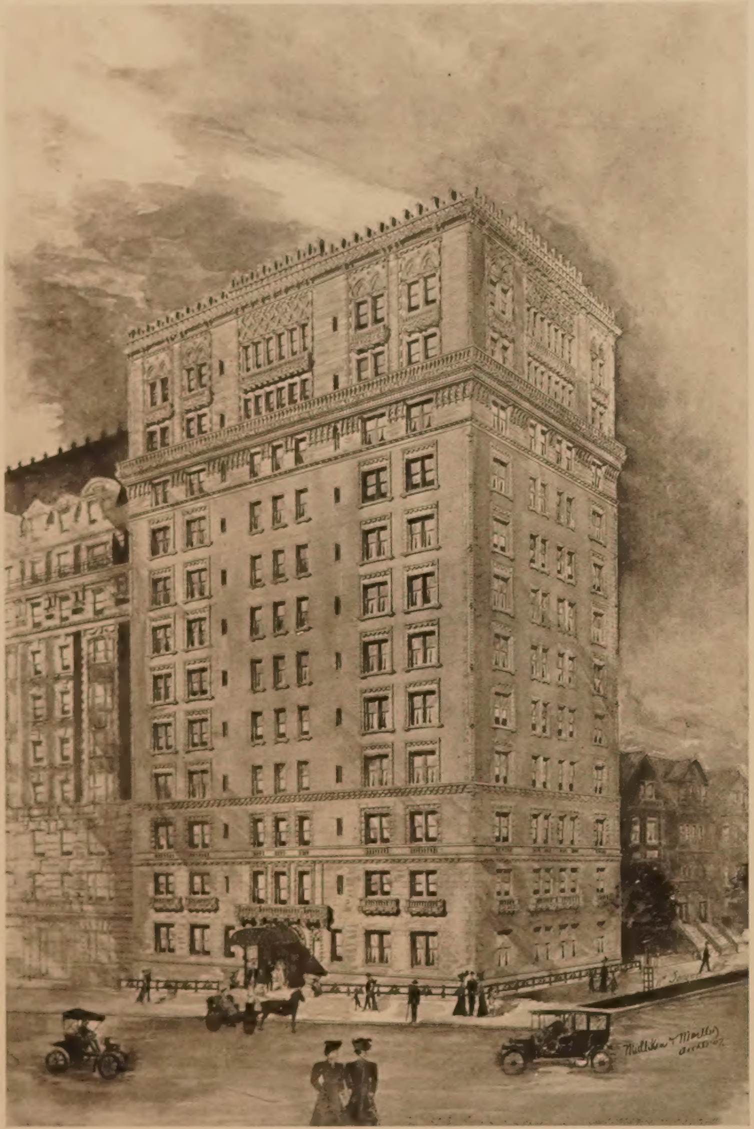
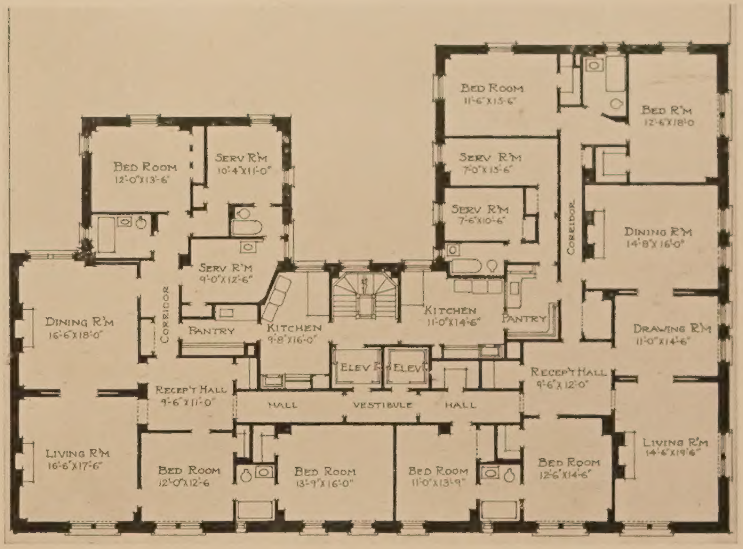
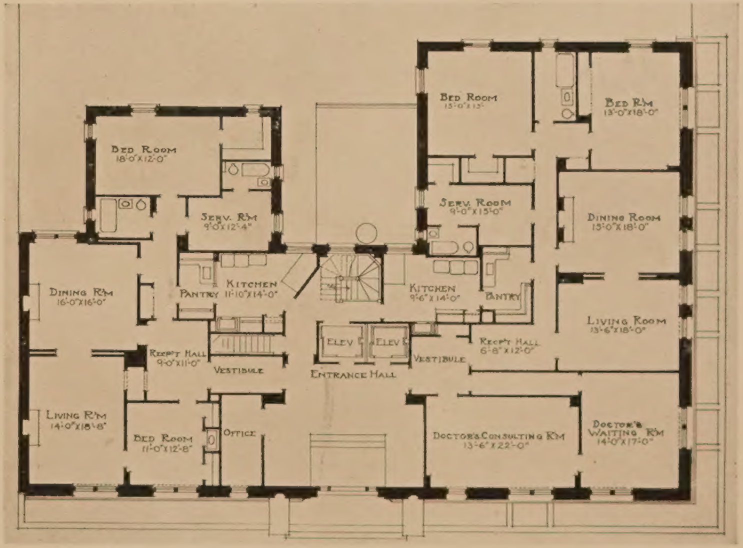






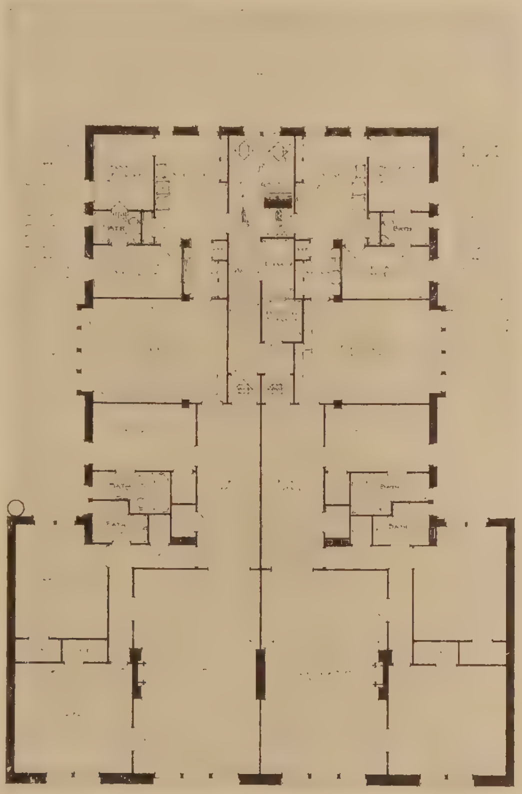
PERSPECTIVE AND PLANS, APARTMENT HOUSE, 76TH ST. AND WEST END AVE., NEW YORK.

Mulliken & Moeller, Architects.

(Continued from page 57)

ally made a great hit with the owner, who increased his revenue from the building by the rent of the extra floor thus obtained, the cubical contents of the building still remaining the same. This is exactly what was done at the 30th Street apartment house. There is not another apartment in New York city on a 60-foot street of more than eight stories. Here there are nine, and as the apartments rent at about $3,500 apiece, and there are two on a floor, this means an extra $7,000 in revenue, which is not to be disdained. The largest floor slab, which is 16 feet square, reinforced in both directions, is six inches thick. On top of this we have 7-8-inch sleepers, one 7-8-inch rough flooring and about 3-8-inch wood carpeting finish, and about 3-4 inch of plastering on the under side, making 8 7-8 inches, or say 9 inches total floor thickness as over against, if the construction had been the ordinary steel skeleton construction with fireproof arches, from 14 to 16 inches in thickness, a saving of from 5 to 7 inches which, in the course of nine stories, makes, roughly speaking, about four feet gained, and this, with keeping the ceilings a little lower, made up enough for the extra story.

As an earthquake-resisting material, it also gave a very good account of itself in the San Francisco catastrophe, as shown by one of the Leland Stanford University buildings at Palo Alto, where the reinforced concrete part of it stood the shake admirably while the brick part of it collapsed.



TYPICAL FLOOR PLAN, THE NOTTINGHAM APARTMENTS, NEW YORK.
(See plate xxxvi)

Whether there is any real gain in the point of time in erecting a reinforced concrete frame or not, cannot be said. At the apartment house in East 30th Street the entire frame was put up in about nine weeks—that is to say, at the rate of a floor a week. Of course in times of great business activity, when it is hard to get deliveries of the various structural steel shapes, a gain in time can probably be effected, as ordinary round bars can be bought much easier than the various eye tee or angle shapes. Some buildings in reinforced concrete here in the city seem to have gone very slowly. This probably depends entirely upon the experience and excellence of the framers who build the forms. If they understand their business and push the work, the building will go rapidly. If they do not, they will hold back the concrete people. These are some few of the distinct advantages.

Among its disadvantages is the fact that it is not an easy material to handle in winter. Some of the best authorities claim that by heating the water and mixing in a certain amount of salt as an ingredient freezing can be prevented, and the material can be just as well put in cold weather as in warm.

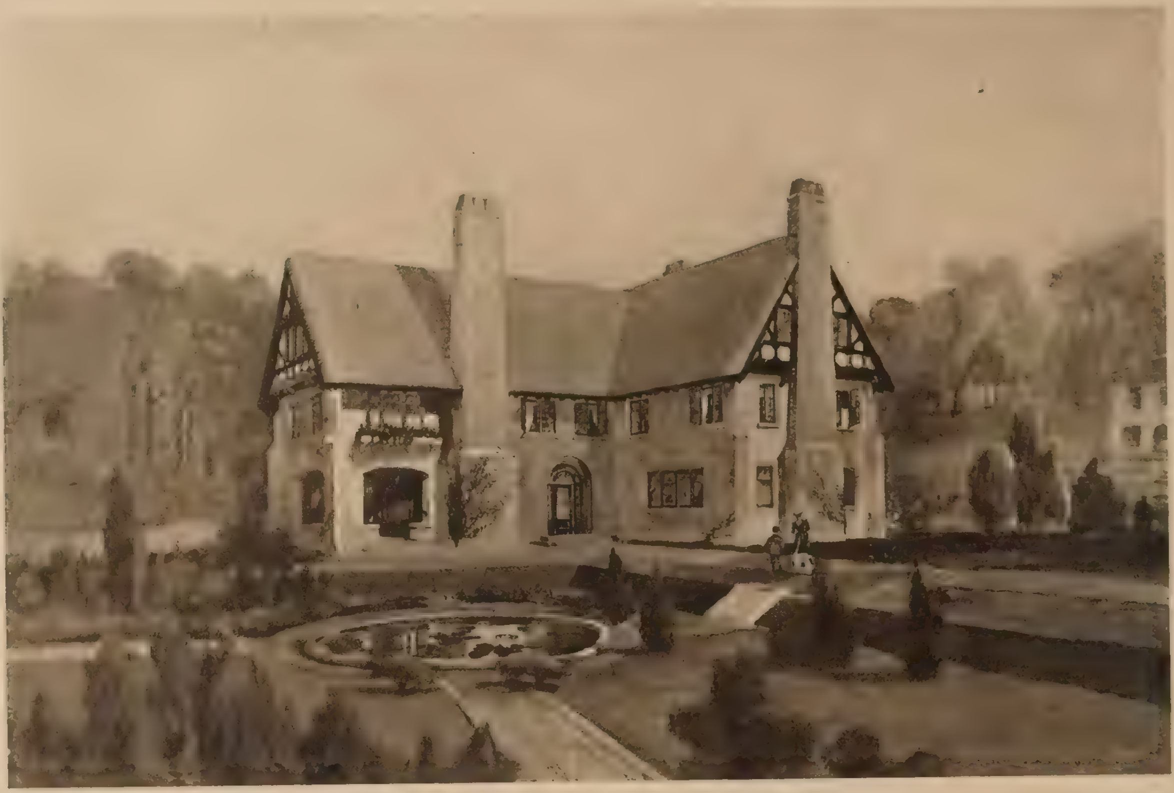
Another disadvantage of the material, if it can be called a disadvantage, is the fact that the entire excellence of it depends upon the workmanship, and that, although it can actually be put in place by unskilled laborers, it necessitates one or two excellent and intelligent foremen on the job to supervise these laborers, and it also requires constant superintendence from the office having the job in charge. Where accidents have occurred in this kind of construction, it was most likely were due to hasty construction and poor workmanship.

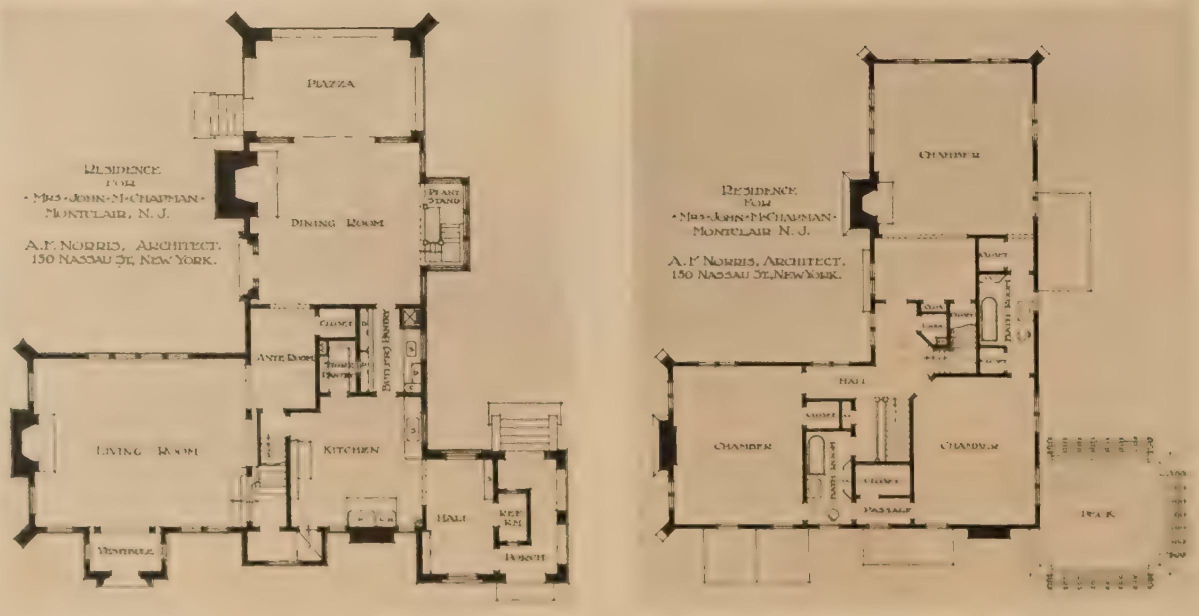
Nearly all the building regulations of the various cities require that the best of materials shall be used so that these accidents can hardly be attributed to a use of poor material, although if a building was put up somewhere out in the country, where there was no supervision of a building department, and the architect chose to use a low grade cement and a poor concrete mixture, he would, of course, run a very great risk of having his building collapse on him.

Another disadvantage, until the regulations are somewhat changed, is the question of the columns here in Manhattan. The Building Bureau will only let us work vertical members up to unit stress of 350 lbs. per sq. in. This, of course, makes the columns become very large in the lower stories, where the weights become considerable. In certain states larger unit stresses than these are permitted, and some of the companies have devised upright supports, which have not only vertical reinforcements in them, but which are also wound around laterally with rods, this, they claim, strengthens them very materially. Mr. Dewey, the chief concrete examiner in the Manhattan Bureau of Buildings, says they are not yet ready to put forth regulations and a formula for the wound column, but that they are working on this matter at the present time, and also arranging for a series of tests on columns of this sort to be made at the Watertown Arsenal, near Boston. Until some such formula is derived and very materially increases the unit stresses permitted on the vertical members, the use of reinforced concrete for the uprights in buildings of any height will be precluded.

When discussing the advantages of the material,

(Continued page 65)





PERSPECTIVE AND PLANS, COUNTRY HOUSE, MRS. J. M. CHAPMAN, MONTCLAIR, N. J. A. F. Norris, Architect.

(Continued from page 63)

nothing was said about the question of the calculations from the engineering point of view or this kind of construction. In this respect it also has a distinct advantage over the steel skeleton work, because the calculations are not many nor are they difficult or complicated, and they can very well be done in any architect's office; an arrangement which is much to be desired. Up to the present time, architects have known very little about the engineering side of reinforced concrete, and, owing to the fact that there are so many different companies holding patents on the various methods of construction, who each and every one have systems of calculation of their own, most of the engineering has been left to the company who finally gets the contract for the work. This necessarily means that they do not all of them bid upon the same basis, and the temptation to get the price down as low as possible by skimping in the material is almost more than human nature can resist. For this reason, all the engineering for this work should, in my opinion, be done in the architect's office rather than, as is now the case, in the offices of the various reinforced concrete companies. The drawings should also be made in the office of the architect, and the concrete framing show the dimensions of all the different parts of the concrete work. This may seem a Herculean task, and one which would require the employment of an engineer in the architect's office and the expenditure of an enormous amount of time and money, but if the formulæ of M. Christophe for beams and girders and of Herr Ritter, the German engineer, for floor slabs are used, the work is not, after all, so onerous. A discussion of these formulæ would hardly be in order in this place.

A few suggestions culled from my own experience in using this material may not be out of place. I have already spoken of the desirability of having good framers to handle the forms for this work. I may even go further than this and say that this is absolutely essential. Unless the carpenters who are entrusted with this work have had experience in it and can push it ahead rapidly, they will be worse than useless on the job. Again, most of the mixing, in work of any magnitude, should be done by mechanical means. At 30th Street we used a large rotary mixer, which we ran by electric current taken from the Edison street mains. This we found very satisfactory. A man to oversee the mixing who has a good level head on his shoulders and does not lose it, and who at the same time is gifted with a liberal flow of judicious profanity to keep the Italian laborers moving at a good smart pace, is a most useful adjunct. In our particular case we found such a person in a very intelligent colored man. He never lost track of the material that went into the mixer and always had a line of Italian laborers, some on one side with barrows full of sand and others on the opposite side with some full of stone ready to dump in in the proper proportions. These proportions as laid down by the regulations of the Building Department are 1, 2, and 4, and the matrix should be 3-4-inch trap rock. Although gravel, Mr. Woolson, of the School of Mechanical Engineering at Columbia University, tells me, will make just about as good concrete as trap rock, its use is not permitted here in this city.

Another suggestion I would put forward is that after the first tier of slabs is in place and the mixer and hoist are installed at or near the middle of the building, provision should be made for driving in the carts right on the slabs of the first floor so as to dump the material as near the mixer as possible. This will save handling and, consequently, a great deal of good money. At the garage in 93rd Street this was done and the floors bore the loads admirably. At the 30th Street job, where we had interior supports, we found difficulty in getting the drivers of the material men to drive into the building and out again, and we had to deposit most of our material in the street and so handle it twice. This is not to be desired if it can be avoided.

When the forms are set, great care should be taken to see that they are gotten as level as possible, because in order to save space, it is desirable to plaster right on the under side of the slabs without any furring. This is perfectly feasible if these slabs are kept sufficiently wet when the scratch coat is put on. The floors can always be leveled up by blocking up the sleepers and adding cinder concrete but there is no way without furring of leveling up the under side of the slabs. We had some difficulty with this at 30th Street, and lost space in certain rooms where the floors had to be thickened at certain points to make them level. Again, when the concrete is put in, a certain amount of shrinkage takes place, and the forms should be built a little fuller than shown on the framing drawings, so that when the building department inspector comes around after the slabs are set he will not claim, as he did on one of our tiers at 30th Street, that our slabs were shy. The shrinkage that took place in a five-inch slab was almost half an inch. In placing the material in the column forms care should be taken to see that the material is well worked and rammed around the outside so as to work the stones back from the outside so that a perfectly smooth surface may be obtained. Forms, of course, should be mill-planed, or it would be very difficult to remove them from the concrete after it had once set; if they were left rough, the rough fibres biting into the concrete would tend to pull off great slivers of the wood. To make this matter of removal even easier still, the forms should be well moistened when the concrete is put in, or some engineers prefer to oil them. This I myself have not yet tried and do not know how well it works. I have written it into the specifications for the reinforced concrete at the Stapleton Ferry Terminal, and after this work has gone ahead, I shall be better able to say which of these methods of lubricating the forms is the better. If the floor slabs are to be plastered on the under side, the forms for this part of the work should not be oiled, as the concrete absorbs the oil and prevents the plaster from adhering later.

The question of the attitude of the labor unions towards reinforced concrete is one which, of course, may very readily influence for a time its larger adoption, but I hardly think that any decisions they may take can have a permanent effect upon it. The material is too admirable and has too many advantages, and is too much along the lines of real progress for them to be able to hold it back for any length of time.

ARCHITECTS desiring to obtain the best results in tone and finish for the various woods used for trim in the different kinds of buildings should not fail to communicate with or call upon Mr. J. W. Whitehead, Jr., 1 Madison Avenue, who has charge of the Architectural Department for the Chicago Varnish Company, for sample panels and a specification for the application of the material.

THE SCHOOLS OF ORNAMENT.[*]

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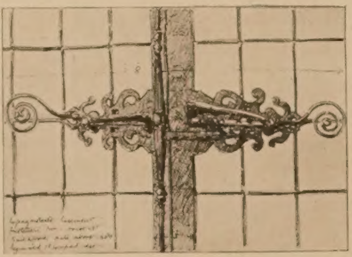
English Renaissance.

1500 to 1800. Inigo Jones, Gibbs, Wren, Gibbons, Burlington, Chambers, Sheraton, Hepplewhite, Chippendale, Cipriani, Mathias Lock, Copeland, Gillow, Bloomfield, Loftie.

INDIRECTLY quoting Mr. Loftie in "Inigo Jones and Christopher Wren," Jacobean architecture came in gradually toward the end of Elizabeth's reign and through the reign of James I. John of Padua, and other Italian architects and designers, brought about the change, which, becoming more pronounced, was helped by the influence of Torregiano, who came to England in 1503, he to whom Michel Angelo owed his broken nose. Torregiano built several mortuary monuments, of which the most noted is the tomb of Henry VII. From this time on the Italian Renaissance, as interpreted by Palladio, held full sway. Palladio's famous book on architecture was published in Venice in 1570, and was often translated into English, Isaac Ware's four books of Palladio being published through the kindness of Lord Burlington. Largely by these translations and the influence of foreign travel, such men as Inigo Jones, Christopher Wren, James Gibbs, Burlington, Chambers and others, were schooled in the beauties of the Italian master, and were inspired by his spirit.

Inigo Jones, born 1573, is the man to whom modern designers of the English-speaking race owe much. He first broke away from the old customs of Elizabeth's time, and instead of leaving details to the master masons and carpenters and carvers, made his own drawings, and saw that they were executed. This certainly was a purely professional method, and was followed by Wren also, whose breadth of mind was seen when he allowed Grinling Gibbons full sway, and did not grudge him the fame which this great carver so fairly deserved. Gibbons was born at Rotterdam in 1648, and died in London in 1720. He was a noted sculptor, as well as a carver of architectural ornament, in which branch he is the most famous carver of the English Renaissance.



Casement Fastener, Guilford.

Although Jones gained in precision, rapidity of execution and personality in his buildings, his method, of course, resulted in the loss of the charm which always attracts one to Elizabethan oranment, as executed by master builders and carvers in the mediæval way, which, undoubtedly, in all lands and times brings out interesting native characteristics in ornament. Inigo Jones' reform, of course, brought architecture to book, as it were, and imposed on all English Renaissance the dictates of Palladio, as interpreted by Jones, Wren and their successors.

Clock Case and "Quarter-Boys," Rye Church, Sussex.

The characteristics of English Renaissance ornament are, therefore, those of the time of Palladio as transformed by English hands, and Gibbons, undoubtedly, was the most potent English interpreter.

Encarpa of flowers and fruits, panels of game and shell, and other Italian motifs are found in profusion.

The brothers Adam about 1760 began to exercise a considerable, and sometimes questionable, influence on English architecture and ornament, of which our own Colonial gives evidence at times.

To cite the names of all English architects during the Palladian Period would be beyond the scope of this article, but it is impossible to close without speaking of three great furniture designers of the epoch, namely Sheraton, Hepplewhite and Chippendale. The latter published his Cabinet Maker's Directory in 1754, one of the earliest books on furniture in England. Rococo is Chippendale's best vein. Hepplewhite & Co. published a book in 1787-91, and Thomas Sheraton one in 1791-93. The ornament which all these men employed influenced our Colonial ornament considerably, and their furniture is in form the best that Anglo-Saxon designers have yet produced. Among other designers were Cipriani, Mathias Lock, Copeland and Gillow.

However far the work of the brothers Adam fell short of the standard which contemporary critics set up for them,

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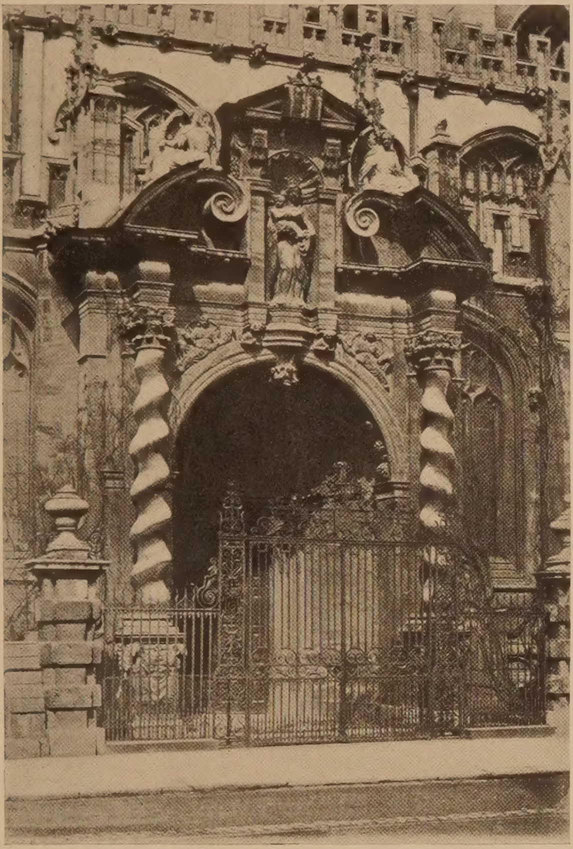
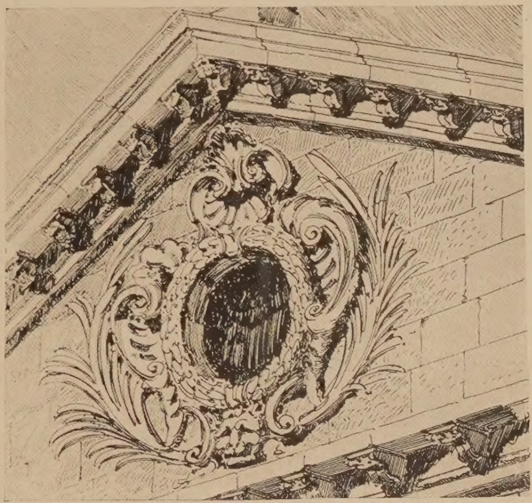
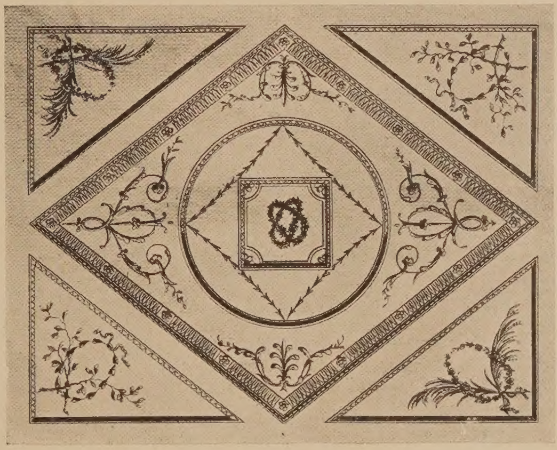
[*] A series of articles written by Mr. William Winthrop Kent, Architect, forming part of "A Treatise on Locks and Builders' Hardware," by Henry R. Towne, President of the Yale & Towne Mfg. Co., and Past President of the American Society of Mechanical Engineers. This book is profusely illustrated and contains more than 1100 pages, 4x6½". John Wiley & Sons, Publishers. Price, $3.00. It is the intention of the publishers of ARCHITECTURE to reprint one school in each number.



St. Mary's Church Doorway, Oxford.



Gable Ornament, St. Martin's-in-the-Fields.



Ceiling in Adam's Style, from Pain's British Palladio.

it is true that the style now known as theirs was the most remarkable, if not the only work, of this epoch in England which showed very strong individuality influenced by precedent. It is much like the ornament of the First Empire in character.

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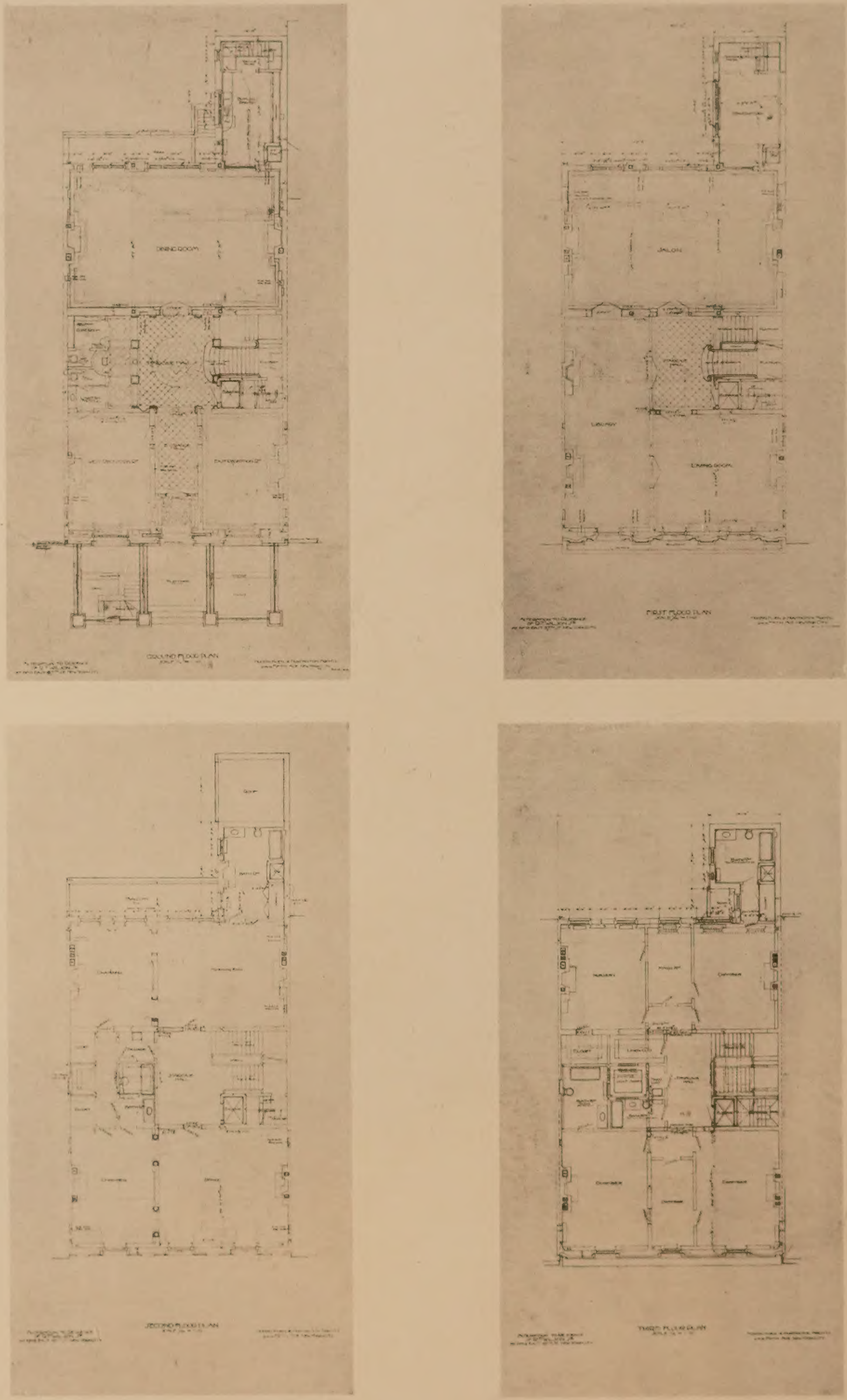

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